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EXAMINER

HU, HENRY S

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 09/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,536

Applicant(s)

DREWNIAK ET AL.

Examiner

Henry S. Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 4, 8, 11 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Specification

1. The disclosure is objected to because of the following informalities:

On page 11 at line 11, recitation of "caprolactum" should be changed to "caprolactam" due to a typographical error. The disclosed compound is a cyclic amide compound, i.e. a lactam with amide linkage.

Appropriate correction is required.

Drawings

2. **INFORMATION ON HOW TO EFFECT DRAWING CHANGES**

2-1. **Correction of Informalities -- 37 CFR 1.85**

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

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2-2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

A notice of draftsperson's patent drawing review (Form 948) is attached; please make corrections on item 5 (margins) and item 12 (numbers, letters, and reference characters).

Claim Objections

3. Claims 4, 8, 11 and 15 are objected to because of the following informalities:

(a) On **Claim 4** at lines 5-6 and **Claim 8** at line 10, phrase of "the modified melt strength to the melt strength before modification" should be changed to "the modified melt strength of the final polyolefin blend to the melt strength of the polyolefin blend before modification with the organically modified clay".

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On **Claim 15** at line 5, phrase of “a modified melt strength that is greater than to the melt strength of the blend before modification” should be changed to “a modified melt strength of the final polyolefin blend that is greater than the melt strength of the polyolefin blend before modification with the organically modified clay”.

Please refer to Claim 1 at lines 8-9 for proper wording. Otherwise, one having ordinary skill in the art may be thereby confused since it is vague and indefinite.

(b) On **Claim 11** at line 2, recitation of “**a homopolymer, copolymer, and/or mixture of ethylene and/or propylene**” is vague and not defined. It should be rewritten or regrouped to be consistent with the statement disclosed in the specification on page 9, lines 21 – page 10, line 16 applied to the composition. Otherwise, it may be confusing to the ordinary skill in the art.

(c) On **Claim 8** at line 5, recitation of “optional components” should be changed to “optional additive components” to be consistent with the wording used on its dependent Claim 12 at line 2.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On Claim 1 at line 6, recitation of “**a polyolefin blend**” is vague and indefinite. It is not clear to define where the polymer blend comes from, or to indicate it is **the same blending mixture of polyolefin and functionalized polyolefin on Claim 1 at lines 1-2**. The Applicants need to clarify with the support in the specification. Otherwise, one having ordinary skill in the art may be thereby confused.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States

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for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. *The limitation of parent Claim 1 of the present invention relates to a method of manufacturing an article which comprises: (A) providing a polyolefin/clay nanocomposite masterbatch formed from 0-99 wt% of polyolefin, 1-100 wt% of functionalized polyolefin, 10-50 wt% of organically modified clay; (B) melt blending 1-30 wt% of nanocomposite masterbatch and 70-99 wt% of a polyolefin blend to form a final polyolefin blend and to ensure sufficient exfoliation of the organically modified clay*

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into the final polyolefin blend so that the melt strength of the final polyolefin blend is greater than the melt strength of the polyolefin blend before modification with the nanocomposite masterbatch; and (C) forming the article using the final polyolefin blend. The other parent Claims 4, 8 and 15 relate to Claim 1 but with narrowed limitations. See other limitations of Claims 2-3, 5-7, 9-14 and 16-21.

8. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Usuki et al. (US 5,973,053).

Regarding the limitation of parent **Claim 1**, Usuki et al. disclose a method of **producing a composite clay material and its use in blending** (abstract, line 1-6). In blending with an organo onium ion **with a clay mineral**, Usuki et al. further disclose one method using the main guest molecules having a **polar functional group** to be incorporated into an interlayer section of the clay mineral (see Fig. 1B); one alternating method using the above-mentioned guest molecules with molecular length not more than the organo onium ion, as well as a second guest molecule having no polar group with molecular length not less than the organo onium ion (see Fig. 3) (also see abstract, line 7-22; column 11, line 47 – column 12, line 32).

Usuki et al. furthermore disclose such obtained clay composite may be **further mixed with the rubber material** (abstract, line 23-24; column 30, lines 26-29 and 44-52). It is noted that the **function of the above-mentioned main or first guest molecule**

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is equivalent to the claimed functionalized polyolefin, while the rubber material or the second guest molecule is equivalent to the claimed polyolefin blend. It is also noted that the **blending of an organo onium ion with a clay mineral through ionic bonding in the initial step is equivalent to using an organically modified clay as specifically demonstrated in Figures 1A, 1B, and 2-5.** (See column 7, line 64 - column 8, line 40).

9. Regarding Claim 1, the composition and its preparation method disclosed by Usuki et al. in the above rejection are substantially the same as those specifically shown in Applicants' Examples 1-12 and controls 1-10 (see pages 20-27). Although the reference is silent of the melt strength property, in view of the substantial the same in the composition and its method the Examiner has a reasonable basis to believe that Usuki et al's compositions inherently possess the same claimed properties of present invention. Since PTO does not have proper means to conduct experiments, the burden of proof is now shifted to Applicants to show otherwise. *In re Best*, 195 USPQ 430 (CCPA 1977).

It has been held that where applicant claims a composition in terms of function, property or characteristic where said function is not explicitly shown by the reference and where the examiner has explained why the function, property or characteristic is considered inherent in the prior art, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Best*, 195 USPQ 430, 433 (CCPA 1977); *In re Fitzgerald et al.*, 205 USPQ 594, 596 (CCPA 1980).

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10. With respect to **Claim 12**, Usuki et al. disclose that the composition may **further include carbon, zinc oxide, sulfur and vulcanization accelerator** (column 25, line 25-30; column 27, line 64-66).

With respect to **Claim 20**, the above-mentioned **organo onium ions used by Usuki et al. in Claim 1** is functioning as a **swelling agent** according to the disclosure of the prior art Kawasumi in the rejection of Claim 21 (see column 3, line 20-64).

Since the reference is silent of both melt strength property and **shear viscosity**, the remaining **Claims 2-3, Claims 4-7** for manufacturing an article, **Claims 8-11 and 13-14 as well as Claims 15-19** for such obtained article are thereby rejected with the same reason for the 102/103 rejection for Claim 1.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Usuki et al. (US 5,973,053) in view of Kawasumi et al. (US 4,810,734).

The discussion of the disclosures of the prior art of Usuki et al. as applied to Claims 1-20 of this office action is incorporated here by reference. The differences between Usuki et al. and **Claim 21** are that Usuki et al. do not specifically disclose the use of modified clay comprising a **swelling agent such as protonated amino acid**. Kawasumi teaches that protonated amino acid such as **4-amino-n-butyric acid ion** can be used as a **swelling agent in the preparation of composite material**. The advantage

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is that such a composition allows the layered silicate material constituted the clay material being connected to the polymer through ionic bonding in a dispersion medium (column 3, line 20 – column 4, line 11).

Therefore, one having ordinary skill in the art would find it obvious to modify Usuki's composition by using a protonated amino acid such as 4-amino-n-butyric acid ion as taught by Tomihashi et al., with advantage as such amino acid can be functioning as a swelling agent with ionic bonding to obtain a well-dispersed and ordered composition, and thereby producing a persistent and homogeneous property.

12. Claims 1-21 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Qian et al. (US 6,462,122).

Regarding the limitation of parent **Claim 1**, Qian et al. disclose a method of **producing a nanocomposite concentrate composition comprising a layered silicate material, a matrix polymer comprising a polyolefin and a maleic anhydride-modified polyolefin (abstract, line 1-7), and coupling agents such as an organo onium ion is very useful in blending a non-polar and low-polarity oligomers or polymers with a clay mineral (column 2, line 24 – column 3, line 40).**

Qian et al. further disclose on examples 1-8 (column 18, line 40 – column 22, line 39) the detailed intercalation process through a **masterbatch** (column 21, line 1-23) as

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well as the molding process to manufacture articles (column 17, line 49 – column 18, line 11). It is noted that the **blending of coupling agent such as an organo onium ion with a clay mineral through ionic bonding in the initial step is equivalent to using an organically modified clay as specifically demonstrated in examples 1-8 (see also column 21, line 38-41).**

13. Regarding Claim 1, the composition and its preparation method disclosed by Qian et al. in the above rejection are substantially the same as those specifically shown in **Applicants' Examples 1-12 and controls 1-10** (see pages 20-27). Although the **reference is silent of the melt strength property**, in view of the substantial the same in the composition and its method the Examiner has a reasonable basis to believe that Qian et al's compositions inherently possess the same claimed properties of present invention. Since PTO does not have proper means to conduct experiments, the burden of proof is now shifted to Applicants to show otherwise. *In re Best*, 195 USPQ 430 (CCPA 1977).

It has been held that where applicant claims a composition in terms of function, property or characteristic where said function is not explicitly shown by the reference and where the examiner has explained why the function, property or characteristic is considered inherent in the prior art, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Best*, 195 USPQ 430, 433 (CCPA 1977); *In re Fitzgerald et al.*, 205 USPQ 594, 596 (CCPA 1980).

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14. With respect to **Claim 12**, Qian et al. disclose that the composition may **further include nucleating agents, fillers, plasticizers, impact modifiers and pigments and the like** (column 16, line 23-31).

With respect to **Claims 20 and 21**, the above-mentioned **organo onium ions as well as other multi-charged spacing agents such as aromatic or arylaliphatic amines, phosphines, esters, alcohols and sulfides can be used as a swelling agent by Qian** (column 9, line 12-67).

Since the reference is silent of both melt strength property and **shear viscosity**, the remaining **Claims 2-3, Claims 4-7** for manufacturing an article, **Claims 8-11 and 13-14 as well as Claims 15-19** for such obtained article are thereby rejected with the same reason in the 102/103 rejection for Claim 1.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a method of manufacturing an article, which comprises: **providing a polyolefin/clay nanocomposite masterbatch, melt blending nanocomposite masterbatch and a polyolefin blend, and forming the article:**

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US Patent No. **6,153,680 to Shah et al.** disclose the preparation of a thermoplastic polymer alloy composition comprising a blend of polypropylene, uncrosslinked ethylene copolymer and particulate filler such as a clay (column 4, line 54; abstract, line 1-5).

Two different methods are disclosed for blending (column 2, line 18-30). However,

Shah et al. fail to teach using an organo-modified clay as well as using the masterbatch.


16. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is (703) 305-4918.

The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (703) 308-2450. The fax number for the organization where this application or proceeding is assigned is (703) 746-9051. Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308-0661.


Henry S. Hu

September 2, 2003


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